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23. An article of manufacture that can be exposed to a hot gas, the article of manufacture comprising:  
a metallic substrate; and  
a thermal barrier coating disposed on the metallic substrate for thermally insulating the metallic substrate from a hot gas, the thermal barrier coating comprising a spinel material throughout a full depth of the thermal barrier coating.

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24. The article of manufacture of claim 23, wherein the thermal barrier coating consists of the spinel material throughout the full depth of the thermal barrier coating.

25. The article of manufacture of claim 23, wherein the thermal barrier coating further comprises an oxide material admixed to the spinel material.

26. The article of manufacture of claim 23, further comprising the spinel material being deposited directly on a surface of the metallic substrate.

27. The article of manufacture of claim 26, wherein the surface of the metallic substrate comprises a roughness providing a mechanical anchoring of the thermal barrier coating.

28. The article of manufacture of claim 23, further comprising a bond coat material disposed between the metallic substrate and the thermal barrier coating, wherein the surface of the bond coat material comprises a roughness providing a mechanical anchoring of the thermal barrier coating.

29. The article of manufacture of claim 23, wherein a first portion of the thermal barrier coating comprises the spinel material in its normal form and a second portion of the thermal barrier coating comprises the spinel material in its inverse form.

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30. The article of manufacture of claim 23, wherein the spinel material consists essentially of magnesium aluminate.

31. The article of manufacture of claim 23, wherein the spinel material comprises magnesium aluminate.